

## **PUSHOVER ANALYSIS OF A MULTI-STOREYED BUILDING**

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**Abstract-** The promise of performance based seismic engineering (PBSE) is to produce structures with predictable seismic performance. Each building designed by this process is virtually unique. Therefore, up to now PBSE has not been an economically feasible alternative to conventional prescriptive code design practices. The poor performance and high level of structural damage in building structures during the frequent earthquakes increased the need to the determination and evaluation of the damages in the building type of structures, so much more than ever before. In order to prevent such collapse mechanisms in the building structures, nonlinear analysis must be determined accurately. To evaluate the performance of framed buildings under future expected earthquakes, a nonlinear static pushover analysis has been conducted. The load-deformation curve is obtained from SAP2000. Firstly, a multi-storeyed building (G+4) is analyzed in STAAD.Pro. The calculation of design seismic force by static analysis method has been carried out and lateral load distribution with height is shown. The same building is then modeled in SAP platform to carry out pushover analysis. The Capacity Spectrum, Demand Spectrum and

Performance point of the building was found in both X and Y direction using the analysis carried out in SAP 2000 (v14). From the performance point it was found that the base shear carried by the building is well above the design base shear. Finally, the maximum displacement was found to be less than 1% which indicates the chance of crossing the elastic state for the building is very less.

**Keywords-** PBSE, Pushover analysis, Nonlinear Static analysis.

### **1. INTRODUCTION**

One of the emerging fields in seismic design of structures is the Performance Based Design. The promise of performance based seismic engineering (PBSE) is to produce structures with predictable seismic performance. In coming few years we can say that performance based design will become the standard method of delivering earthquake resistant designs. Seismic design is slowly transforming from a stage where a linear elastic analysis for a structure was sufficient for both its elastic and ductile design, to a stage where especially dedicated non-linear procedure is to be done, which finally influences the seismic design as a whole. Seismic hazard and damage state are the two essential parts of a performance

# Pushover Analysis Of A Multi Storeyed Building

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## **Pushover Analysis Of A Multi Storeyed Building:**

**A Study of Seismic Strengthening of Multi Storey Building** Dr. Ashad Ullah Qureshi, 2022-06-01 Earthquakes even though they occur rarely induce inertia force which is dynamic and complex. Moreover, they are sometimes so devastating that it is worth going into the depth of understanding them. The current work is one step towards understanding the complex effects of this dynamic force, particularly on low-rise RC structures which are found in almost all parts of the world. During the 2001 Bhuj earthquake in India, a major damage was observed in RC framed structures at Ahmedabad which were in the range of G 3 to G 7 storey. Most of the buildings were having a normal grid of 3m x 3m column spacing with a storey height of 3m. Hence, the present work, which is expected to act as a guide line for Civil and Structural Engineers in smaller towns and cities where expert advice may not be easily available, is devoted to RC framed structures ranging from G 3 to G 7 storeys.

**Seismic Behaviour and Design of Irregular and Complex Civil Structures IV** Rita Bento, Mario De Stefano, Dietlinde Köber, Zbigniew Zembaty, 2022-01-18 This volume contains papers of the 9th European Workshop on the Seismic Behaviour of Irregular and Complex Structures (9EWICS) held in Lisbon, Portugal, in 2020. This workshop, organized at Instituto Superior Técnico University of Lisbon, continued the successful three annual series of workshops started back in 1996. Its organization had the sponsorship of Working Group 8 Seismic Behaviour of Irregular and Complex Structures of the European Association of Earthquake Engineering. This international event provided a platform for discussion and exchange of ideas and unveiled new insights on the possibilities and challenges of irregular and complex structures under seismic actions. The topics addressed include criteria for regularity, seismic design of irregular structures, seismic assessment of irregular and complex structures, retrofit of irregular and complex structures, and soil-structure interaction for irregular and complex structures. Beyond an excellent number of interesting papers on these topics, this volume includes the papers of two invited lectures: one devoted to irregularities in RC buildings, including perspectives in current seismic design codes, difficulties in their application, and further research needs; and another one dedicated to the challenging and very up-to-date topic in the area of seismic response of masonry building aggregates in historical centers. This volume includes 26 contributions from authors of 11 countries, giving a complete and international view of the problem. It holds particular interest for all the community involved in the challenging task of seismic design, assessment, and/or retrofit of irregular and complex structures. **Recent**

**Advances in Structural Engineering—Vol. 4** B. Kondraivendhan, S. A. Vasanwala, Indrajit N. Patel, U. Johnson Alengaram, 2025-11-12 This book presents RAISE 2024 proceedings, which cover all the recent advances happening in the Structural Engineering towards sustainable development and technology among different research areas of Civil Engineering. The main objective of this book is to disseminate the recent developments in Structural Engineering and related interdisciplinary research areas. This book will cover three main themes, including bridge engineering, tall concrete structures, and interdisciplinary research areas, emphasizing their significant applications in sustainable Environment, seismic, and

disaster mitigation and long durable concrete structures      Urban Habitat Constructions Under Catastrophic Events  
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*Investigation of Pushover Analysis Procedures for Reliability-based and Performance-based Seismic Design with Applications to Asymmetric Building Structures* Po-Tuan Chen,1999      **Evaluation of the Modal Pushover Analysis Procedure Using Vertically "regular" and Irregular Generic Frames** Chatpan Chintanapakdee,Anil K. Chopra,2003  
*A Modal Pushover Analysis Procedure to Estimate Seismic Demands for Buildings* Anil K. Chopra,2001      Proceedings,2002      **Proceedings, Sixth U.S. National Conference on Earthquake Engineering, May 31-June 4, 1998, Seattle, Washington** ,1998 The Proceedings CD ROM contains the full text of over 300 papers presented at the conference in addition to the full text of the final program Papers are indexed by author and topic and are full text searchable  
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web 5 3 first wash the used glassware properly with raw water 5 4 then scrub the glassware with 0 1 detergent solution 1 ml  
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web the water should be hot for glassware that is exceptionally dirty a cleaning powder with a mild abrasive action will give  
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residue from your lab s glassware keep it clean part of ensuring that glassware is clean depends on a lab putting a system in  
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